University of Gdańsk

Subject card

Subject name and code	Mathematics for Informatics, PG_00143952		
Field of study	Informatics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	Master's studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish polish
Semester of study	3	ECTS credits	6.0
Learning profile	academic	Assessment form	
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr Maciej Dziemiańczuk	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	60	0.0	90.0	150

Subject objectives	The aim of the course is to introduce students to fundamental combinatorial objects, generating functions, and basic counting techniques. Familiarizing students with English terminology.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[INFMU2_U02] is able to formulate questions with precision, serving to deepen his/her own reasoning on a given topic or to find missing elements of reasoning	Can formulate precise questions regarding basic combinatorial techniques.	[SU8] observation of student's independent or team work
[INFMU2_W01] has in-depth knowledge of the branches of mathematics necessary for the study of computer science; has a good understanding of the role and importance of the construction of mathematical reasoning	Is familiar with basic mathematical structures used to describe algorithms. Knows fundamental concepts and techniques used for analyzing the computational complexity of algorithms.	[SW4] test/exam - oral or written
[INFMU2_U01] can apply mathematical knowledge to formulate, analyze and solve tasks related to computer science	Is familiar with basic combinatorial objects used for describing and analyzing the computational complexity of algorithms. Can derive formulas for the count of simple combinatorial objects such as sequences, permutations, combinations, variations, partitions of numbers, and partitions of sets.	[SU4] test/exam - oral or written
[INFMU2_U03] designs, analyzes for correctness and computational complexity, and builds algorithms using advanced programming techniques and data structures	Can utilize knowledge of combinatorics to analyze the computational complexity of algorithms.	[SU4] test/exam - oral or written
[INFMU2_K01] knows the limits of his own knowledge and understands the need for further learning	Is aware of the limitations of their knowledge in combinatorics and understands the need for further learning.	[SK8] observation of student's independent or team work

Subject contents

1. Counting combinatorial objects: sequences, subsets, permutations, derangements, set partitions, integer partitions, necklaces, arrangements of balls in boxes; 2. Principle of sum, product, pigeonhole, double counting; 3. Counting non-isomorphic objects, Burnside's lemma and Polya's theorem; 4. Generating functions, solving recurrences;

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
tests	51.0%	50.0%
exam	51.0%	50.0%

Recommended reading

Basic literature	1. G. E. Martin, Counting: The Art of Enumerative Combinatorics, Springer 2001; 2. P. J. Cameron, Combinatorics, Cambridge University Press, 1994;
Supplementary literature	not aplicable
eResources addresses	

Example issues/ example questions/ tasks being completed

not aplicable

Work placement

Not applicable

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